

REMARKS**Introduction**

Applicants thank the Examiner for carefully considering the subject application.

The above amendments and these remarks are responsive to the Office Action mailed July 14, 2005. With entry of this amendment, claims 41-46 are cancelled, and claims 1-40 are pending. The Office action mailed July 14, 2005 primarily relies on Bartley et al. (U.S. 6,482,377) and the theory of obviousness in examining the claims. Before discussing this position in detail, Applicants believe it may be helpful to review some background information.

As described in Applicants' specification, various mechanisms have been developed to reduce NOx emissions in lean-burning engines. One mechanism is a catalyst known as a NOx trap. While the use of a NOx trap can substantially reduce NOx emissions from a lean-burning engine, NOx traps are also susceptible to poisoning from sulfur in fuels, thus degrading performance.

Therefore, to reinstate performance, various methods of desulfating NOx traps may be used. These methods, while effective in removing SOx from the trap surfaces, can cause the production of hydrogen sulfide. Specifically, the inventors herein have recognized that variations in air-fuel ratio that may occur at certain stages of reactions can cause the production of hydrogen sulfide in different ways depending on exhaust temperature. Thus, one approach to solve this problem is set forth in claim 1, which claims:

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A method of removing hydrogen sulfide from an emissions stream, comprising:

directing the emissions stream into a hydrogen sulfide converter having a metal oxide catalyst;

adsorbing the hydrogen sulfide in the emissions stream to the metal oxide catalyst in the hydrogen sulfide converter;

reacting the hydrogen sulfide with at least one of an oxidant and a reductant in the hydrogen sulfide converter to chemically transform the hydrogen sulfide; and

adjusting an air-fuel ratio of the emissions stream based on exhaust temperature of an emission control device, where said adjustment varies a duration of at least one of lean and rich operation to perform said adsorbing and reacting even as exhaust temperature varies.

Specifically, by adjusting the air-fuel ratio of the emissions stream based on exhaust temperature of an emission control device (where the adjustment varies a duration of at least one of lean and rich operation to perform the adsorbing and reacting even as exhaust temperature varies), it is possible to reduce the emission of hydrogen sulfide across a wider temperature range.

Bartley et al.

Turning now to Bartley et al., the Office action admits that it fails to show adjusting an air-fuel ratio based on exhaust temperature, but goes on to conclude that such a feature would be obvious. Applicants disagree with this conclusion and the reasoning in support thereof.

First, Applicants respectfully submit that Bartley et al. suffers from precisely the same problems as noted above. *I.e.*, because Bartley et al. does not adjust air-fuel ratio based on temperature, there can be no compensation of the lean and rich operation to perform the adsorbing and reacting of hydrogen sulfide even as exhaust temperature varies in a way that results in reduce emissions of hydrogen sulfide. Further, Bartley et al. gives absolutely no hint of how to perform any adjustment of air-fuel ratio, or even that temperature of the emission

control device should be considered for such adjustments. Thus, Applicants respectfully submit that adding such features to the method of Bartley et al. would hardly be obvious.

Second, Applicants submit that the reasoning set forth in the Office action in support of the obviousness conclusion is flawed. Specifically, the Office action states at pg. 3:

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the air-fuel ratio to either rich or lean in the method of Bartley because Bartley discloses operation of the method for both lean and rich stoichiometries (see column 5, lines 44-46 and 56-58), which would obviously, to one of ordinary skill, suggest adjustment of the ratio to perform the method at the disclosed rich and lean stages.

Assuming Bartley et al. suggests adjustment of air-fuel ratio to perform the method at lean and rich stages, there is still no disclosure of performing such adjustments in response to temperature of the emission control device. The Office action fails to allege such a feature is shown or even suggested in the cited art.

As such, Applicants request that the rejection of claim 1 be withdrawn. Similar arguments also apply to claims 16, 21, and 31.

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is respectfully requested to contact the undersigned by fax or telephone at the number listed below.

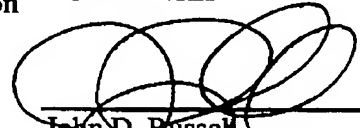
Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No.06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.

CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being sent via facsimile to the U.S. Patent and Trademark Office at (571) 273-8300 on October 12, 2005.


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